

CLAIMS

1. Process for the gas diffusion coating of metal components in which the surface of a component which is to be coated is brought into contact with a metal halide as a coating gas with the formation of a diffusion layer with a particular layer thickness and a particular coating metal concentration as % by weight on the surface of the component, starting from a specified concentration of the metal halide on the surface of the component giving rise to a specific coating time at a specified coating temperature, characterised in that a first concentration for the metal halide lying above the nominal concentration is produced over a first period of time and at least one second concentration which is equal to or less than the nominal concentration is established over at least a second period in which the first and the at least one second period are selected so that the sum of the two is shorter than the coating time with the nominal concentration.

2. Process according to claim 1, characterised in that the metal halide is produced by the reaction of a halogen or a halogenide with a coating metal present in a supply source.

3. Process according to claim 1 or 2, characterised in that the metal halide contains F or Cl.

4. Process according to one or more of the preceding claims, characterised in that the coating metal is prepared from Al and/or Cr or alloys of these.

5. Process according to claim 4, characterised in that the coating metal also contains one or more of the elements Si, Pt, Pd, Hf and Y.

6. Process according to one or more of the preceding claims, characterised in that a diffusion layer with a coating thickness of 25 to 100 μm is formed.

7. Process according to one or more of the preceding claims, characterised in that a diffusion layer with a coating metal content of 25 to 32% by weight is formed on the surface of the component.

8. Process according to claim 6 and 7, characterised in that the first period is timed to be between 5 and 6 hours and the at least one second period is timed to be between 3 and 4 hours.

9. Process according to one or more of claims 1 to 7, characterised in that the first period is timed to be between 2 and 10 hours and the at least one second period is timed to be between 1 and 6 hours.

10. Process according to one or more of the preceding claims, characterised in that a coating temperature in the range of 900 to 1200 $^{\circ}\text{C}$ is maintained during the first and second periods.

11. Process according to claim 10, characterised in that a coating temperature in the range from 1000 to 1100 $^{\circ}\text{C}$ is maintained during the first and second periods.

12. Process according to one or more of the preceding claims, characterised in that a second concentration in a second period is adjusted to be almost zero.

13. Process according to one or more of the preceding claims, characterised in that the at least one second concentration is brought about through the addition of an inert gas or hydrogen or by reducing the availability of delivered halogen or halogenide.

14. Process according to one or more of the preceding claims, characterised in that Pt is galvanically removed from the surface of the component prior to formation of the diffusion layer.

15. Process according to one or more of the preceding claims, characterised in that before forming the diffusion layer at least one element such as Pt, Si, Y, Hf or mixtures or alloys such as MCrAlY (with Ni and/or Co as M) is deposited on the surface of the component as a slip or plasma spray.

16. Process according to one or more of the preceding claims, characterised in that the pressure of the coating gas is at least varied over time in the first and/or second period.

17. Process according to one or more of the preceding claims, characterised in that the second concentration is adjusted by reducing the pressure.